

NOTES ON SOUTH AUSTRALIAN MARINE MOLLUSCA,
WITH DESCRIPTIONS OF NEW SPECIES.—PART IX.

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[Read October 6, 1908.]

PLATES XIV. TO XVIII.

Turbo jourdani, Kiener. Pl. xviii., f. 32, 33.

This very rare shell was named and described by Kiener in 1839 in the *Rev. Zool. Soc. Cuvier*, p. 324, and figured in the *Mag. de Zool. de Guérin*, 1840, *Moll.*, pl. ix. To neither of these works have we access.

In 1843 Deshayes, in his edition of Lamarck's *Anim. s. Vert.*, vol. ix., p. 224, says it belonged to the collection of Mons. Jourdan, after whom it was named.

In 1846 Philippi, in the *Conch. Cab.*, ed. ii., Band ii., Abt. ii. and iii., p. 56, pl. xiii., f. 4, gives a description and figure, with the remark that he had never seen the species.

In 1848 Reeve, in *Conch. Icon.*, Sp. 41, pl. xiii., writes: "Of this species there are two examples in the British Museum."

In 1873 Fischer, in *Coq. Viv.*, Genus *Turbo*, p. 11, pl. xviii., gives a description and an excellent illustration of the smooth form.

In 1887 G. B. Sowerby, in the *Thes. Conch.*, vol. v., p. 192, Sp. 8, pl. vi., f. 62, figures the form, which is validly spirally ribbed in the spire-whorls and obsoletely in the body-whorl.

The rarity of the shell is evident from the fact that all the above references but two are to the single shell belonging to M. Jourdan. Its habitat was the very indefinite one of "Australia" and "New Holland."

In 1888 Mr. M. M. Maughan found an immature example on the beach of Moonta Bay, in Spencer Gulf. It was identified by Prof. Tate, who held the opinion very strongly that it had been transported thither in ballast. Mr. Maughan saw no ballast about the beach, nor did he at any time gather any foreign shells there, although he did much collecting in the Bay. But no second specimen was ever taken.

In July, 1888, Mr. T. C. Watson, of Streaky Bay, South Australia, gave Mr. W. T. Bednall three specimens, the

largest and best of which, containing the operculum, he presented to the South Australian Museum. It is nearly full-grown, but has had all the coloured external layer removed by erosion except near the aperture, where the mahogany tint and darker lines are still preserved.

On August 1, 1893, the late Prof. Tate, at a meeting of the Royal Society of South Australia, exhibited a specimen obtained in a subfossilized state from the silt of the Port Adelaide Creek at a depth of 24 ft. (Trans. Roy. Soc., S. Austr., vol. xvii., p. 354). This proved the existence at no very remote period of time of this species on the shores of South Australia, and located it in our extra-tropical southern coastline rather than in the tropical waters of Australia.

In 1905 Mr. A. Zietz kindly presented me with an immature bleached individual, which he had received from Fowler Bay.

In December, 1907, Dr. Torr and I searched the West Coast of this State at Port Elliston, Venus Bay, Smoky Bay, Streaky Bay, Scales Bay, Murat Bay, and Denial Bay, and LeHunte Bay, without finding a fragment of this species. But on St. Francis, the largest island in Nuyts Archipelago, we discovered its habitat, and gathered a score of examples in a state of greater or less dilapidation. Although Peron and Baudin called here and carried home many shells from this island and St. Peter's, they seem to have overlooked this Turbo. St. Francis lies some thirty-two miles from Murat Bay, and seventeen miles from the nearest point on the mainland. It has a number of reefs running out into the sea in a southerly, south-westerly, and westerly direction, with small sandy intervening bays. The southern swell is constantly breaking on these rocks and rolling as a surf into the tiny bays. The Turbos were found wedged between the piled-up boulders on the leeseide of the reefs and in the crevices of rocks, and their opercula were cast up on the sandy beaches. It is really an ocean island, and is surrounded by water of thirty fathoms in depth.

We sought for living individuals, but unsuccessfully. Mr. Arnold, who has lived there for many years, found only one, just below watermark, on a rock face on the north of the island, some years ago. He says the animal is of a red colour.

On the top of the rocks were large quantities of opercula and fragments of *Turbo stamineus*, Martyn, which had been taken by gulls from the reefs at low water, and smashed so as to permit them to eat the shellfish; but we did not find a single fragment or operculum of *T. jourdani* among these remnants. Again, although immature *T. stamineus* were

common among the abundant rock-shells cast up on the shore, we collected only two tiny *T. jourdani*. We concluded, therefore, that this rare species lives at a greater depth than *T. stamineus*, hence the gulls cannot get them, and they are but seldom washed up. Dr. Torr explored the reefs in water up to his breast, secured by a safety-line to prevent him from being carried away by the undertow of the swell; but though *T. stamineus* was obtained in abundance, not a single example of *T. jourdani* was taken. This deeper habitat probably accounts for its rarity in collections.

Since writing the above Mrs. J. F. Irvine, of Ingle-side, Tasmania, tells me she has two fairly good specimens, sent to her some years ago by Captain Irvine. They came from Rottneest Island, off the western coast of Western Australia. Dr. Torr also informs me that an individual was taken alive by Mr. Kopp, when he was keeper of the lighthouse at Cape Borda, Kangaroo Island, at low tide, between Cape Borda and Snug Cove, on the shore of Investigator Strait.

The operculum was unknown to Kiener. It is of an oval shape, paucispiral, the largest having only five whorls, with the nucleus at a distance from the wider end of about one-fifth of the long diameter, proportionately much nearer the margin than in any other of our Turbos. The internal surface is slightly concave, with a low rounded cushion where the new spiral touches the old; beyond this is a shallow, rapidly-widening, slightly spiral depression, extending to the border. The external surface is smooth and polished. One margin, in an example 81 mm. in its long diameter, is 16 mm. in thickness, and the opposite is 5 mm., with a gradual slope between. A low spiral fulness runs obliquely across the outer face corresponding with the depression on the other side.

Turbo gruneri, Philippi. Pl. xviii., f. 36, 37.

Philippi, in Zeit. fur Malak, 1846, p. 98, gives the type locality as "The Colony of Adelaide, New Holland." It occurs all along our South Australian coastline, as would be expected since it is found in Victoria, and in Western Australia as far round as Swan River (Sowerby). It has been dredged alive in 12, 13, 15, and 16 fathoms in Investigator Strait and in the open sea outside Backstairs Passage.

The operculum is elliptical and thick, paucispiral, with a chitinous layer on its inner surface. The outer surface is smooth, but shows some curved earlike processes, similar to but not nearly so valid as those found on the opercula of *T. stamineus*.

This character would place it between the *T. undulatus*, Martyn, which is smooth on the outside, and *T. stamineus*, which is markedly auriform and prickly. (Pl. xviii., f. 38, 39, and 34, 35.)

Gibbula legrandi, Petterd.

Fossarina legrandi, Petterd, Journ. of Conch., 1879, p. 104.

Gibbula legrandi, Petterd, Tate and May, Proc. Linn. Soc., New South Wales, 1901, vol. xxvi., part 3, p. 404, pl. xxiv., f. 21, 22; Pritchard and Gatliff, Proc. Roy. Soc., Vict., 1902, vol. xv., part 2, p. 133.

Beachport, shell sand (Verco).

Gibbula galbina, Hedley and May.

Gibbula galbina, Hedley and May, Records of the Austr. Mus., vol. vii., No. 2, 1908, p. 114, pl. xxii., f. 2. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Taken in 110 fathoms off Beachport, two examples dead, one specimen in 130 fathoms off Cape Jaffa.

Minos petterdi, Crosse.

Fossarina petterdi, Crosse, Journ. de Conch., 1870, p. 303; 1871, p. 323, pl. xii., f. 1; Tryon, Man. Conch., 1887, vol. ix., p. 275, pl. lii., f. 20, 21; Pritchard and Gatliff, Roy. Soc., Vict., 1902, vol. xiv. (N.S.), part 2, p. 94.

Minos petterdi, Crosse; Hutton, Proc. Linn. Soc., New South Wales, 1884, p. 369; Lodder, Proc. Roy. Soc., Tasm., 1900, Cat. Tasm. Shells (p. 12 of reprint); Tate and May, Proc. Linn. Soc., New South Wales, 1901, vol. xxvi., part 3, p. 403.

Fossarina simsoni, Tenison-Woods, Proc. Roy. Soc., Tasm., 1876, pp. 149, 150; Tenison-Woods, Proc. Roy. Soc., Vict., 1881, vol. xvii., p. 81; Tryon, Man. Conch., 1887, vol. ix., p. 275.

Glenelg Beach (W. L. Bragg); Henley Beach; St. Francis Island (Verco).

Rissoina rhyllensis, Gatliff and Gabriel.

Rissoina rhyllensis, Gatliff and Gabriel, Proc. Roy. Soc., Vict., 1908, vol. xxi. (N.S.), p. 367, pl. xxi., f. 8. *Type locality*.—Western Port, Victoria.

Dredged in Gulf St. Vincent, several; in 25 fathoms Thorny Passage, one alive, and one dead; one dead in 49 fathoms off Beachport, in 55 fathoms off Cape Borda, and in 90 fathoms off Cape Jaffa; in 110 fathoms off Beachport, forty, some quite fresh; in 130 fathoms off Cape Jaffa, seventeen good and poor; and in 150 fathoms off Beachport, thirteen, fairly good. It seems, therefore, to live in about 100 fathoms, and to be less frequent in the shallower and deeper water.

Rissoina lintea, Hedley and May.

Rissoina lintea, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 117, pl. xxiii., f. 11. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Dredged at the same stations as the preceding species, but in smaller numbers.

Turritella kimberi, n. sp. Pl. xv., f. 14, 15.

Shell thin, long, narrow, imperforate, of ten whorls without the protoconch, which is absent. Another individual shows a long tapering protoconch of four smooth convex white whorls. Sutures deep. Spire-whorls well rounded; with equidistant, low, spiral ribs, six in the penultimate, the infrasutural one being the least valid, the upper slope of the rib very steep and short, nearly vertical, the lower long and sloping; the intercostal furrows appearing in the throat as opaque white capillary spiral lines. The body-whorl has ten spirals; base convex. Aperture slightly oblique, elliptical; outer lip thin, uniformly convex; inner lip a scarcely perceptible glaze on the body-whorl; columellar lip nearly straight, narrowly reflected; basal lip slightly effuse. Colour translucent white.

Dim.—Length, 7·7 mm.; breadth, 1·7; length of aperture, 1·4 mm.; width, ·9.

Locality.—Type, Backstairs Passage, 20 fathoms, with eight others fresh but dead. Port Willunga, one (Kimber).

Type in Dr. Verco's collection.

Obs.—It may reach 8·5 mm. in length.

Diagnosis.—*Turritella parva*, Angas, differs in its brown colour and its light chestnut sutural band, its three keels on the whorls, its subquadrate aperture, and in its columella thickened and produced at the base.

Seila attenuata, Hedley, superficially resembles it, but differs in its anterior notch.

Seila attenuata, Hedley.

Seila attenuata, Hedley, Proc. Linn. Soc., New South Wales, 1900, vol. xxv., part 1, p. 91, pl. iii., f. 9, 9a. *Type locality*.—Middle Harbour, Sydney. Pritchard and Gatliff, Proc. Roy. Soc., Vict., 1906, vol. xviii. (N.S.), part 2, p. 60. Ocean Beach, Point Nepean.

Newland Head, 20 fathoms, one dead; Backstairs Passage and Gulf St. Vincent, eighteen.

Ovula formosa, Adams and Reeve.

Ovula formosa, Adams and Reeve, Voy. Samarang, p. 22, pl. vi., f. 6; Tryon, Man. Conch., vol. vii., 1885, p. 251, pl. iv., f. 15, 16, "Borneo, Japan."

Dredged one example, during many years' dredging in waters from Beachport to the Neptunes, including Gulf St.

Vincent and Spencer Gulf. This was identified for me by Mr. Hedley, who suggested that as a tropical form it had migrated round the western coast of Australia to South Australia, not being found on the eastern coast. This was supported by the securing of a second specimen in better condition, in 30 fathoms, off St. Francis Island, in the Great Australian Bight, during one day's dredging.

Septa petulans, Hedley and May.

Septa petulans, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 118, pl. xxiii., f. 14. *Type locality*.—Pirate's Bay beach, near Cape Pillar, Tasmania; also 100 fathoms off Cape Pillar.

I found a specimen some years ago on the beach at Eagle Hawke Neck, Tasmania, which is identical with the type (*teste* Hedley). Also dredged broken in 200 fathoms off Beachport.

Cymatium columnarium, Hedley and May.

Cymatium columnarium, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 119, pl. xxiii., f. 15. *Type locality*.—100 fathoms off Cape Pillar, Tasmania.

Dredged in 40 fathoms off Beachport, one good; in 60 fathoms north-west of Cape Borda, one immature; in 100 fathoms off Beachport, one good (identified by C. Hedley from the type); in 110 fathoms off Beachport, one good; in 130 fathoms off Cape Jaffa, one good, immature; in 150 fathoms off Beachport, one poor, and in 200 fathoms off Beachport, two poor.

Pyrene plexa, Hedley.

Columbella plexa, Hedley, Proc. Linn. Soc., New South Wales, 1901, part 4, p. 702, f. 25. *Type locality*.—Port Jackson: Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 112, 100 fathoms off Cape Pillar, Tasmania.

Dredged in 104 fathoms, 35 miles south-west of Neptune Islands, fourteen examples.

Arcularia mobilis, Hedley and May.

Arcularia mobilis, Hedley and May, Records Austr. Mus., vol. vii., No. 2, p. 121, pl. xxiii., f. 16, with var. *costata*, f. 17. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Dredged in 100 fathoms off Beachport, one immature; in 130 fathoms off Cape Jaffa, twelve, some good, mostly poor; in 150 fathoms off Beachport, two nearly mature; in 200 fathoms off Beachport, one immature. No examples were taken alive. They do not quite conform either to the type or the variety. As regards the axial costæ they are intermediate, and the spirals are sharper, and wider apart than in either form.

One shell, taken in 150 fathoms off Beachport, is much more attenuate than the type. This measures 7 mm. by 4 mm., whereas that is 6 mm. by 2.9 mm.

***Arcularia grandior*, n. sp.**

Plate xv., f. 16, 17.

Shell large and solid. Whorls nine. Protoconch $2\frac{1}{4}$ turns, smooth; apex scarcely exsert; first whorl depressedly convex, second vertically flatly convex. Spire-whorls convex, shouldered; the angulation starting in the first whorl close to the suture, proportionately more distant from it and less acute in each succeeding whorl, in the penultimate just above the middle. Suture distinct, undulating, narrowly margined. Body-whorl scarcely shouldered. Aperture axially obliquely ovate; outer lip simple, thin, in profile slightly centrally concave; columella concave, obtusely angled at the commencement of the canal which deviates well to the left and is recurved; inner lip, a smooth glaze, complete; notch marked. Sculpture bold; axial costæ, 16 in the penultimate, extending from suture to suture, acute, concavely rounded, as wide as the interspaces, and narrowing over the base to the notch; spirals valid, sharp, concavely rounded, as wide as the spaces, crossing and transversely tuberculating the axials, three in the first whorl, six principals in the penultimate with three intercalated secondaries, 20 altogether in the body-whorl extending validly to the notch; irregular crowded interstitial accremental striæ.

Dim.—Length, 32.5 mm.; of body-whorl, 13 mm.; width, 15 mm.

Locality.—Dead in blue clay in 110 fathoms off Beachport, 3 large; 100 fathoms, 3 fragments; 150 fathoms, 3 fresh, juvenile; 200 fathoms, 2 fresh, juvenile; off Cape Jaffa, in 300 fathoms, 2, juvenile; off Cape Borda, in 55 fathoms, 1 embryonic.

Type in Dr. Verco's collection.

Obs.—A second individual, figured (pl. xv., f. 17), is rather less elate, and the angled shoulder is more persistent. The type is stained blue, but another example is of a light-yellowish-brown tint.

***Coralliophila elaborata*, H. and A. Adams.**

Coralliophila elaborata, H. and A. Adams, Proc. Zool. Soc., Lond., p. 433. *Type locality.*—"Sandwich Islands." Gatliff and Gabriel, Proc. Roy. Soc., Vict., 1908, vol. xxi. (N.S.), part 1, p. 369, "San Remo and Lorne."

Taken at St. Francis Island, west coast of South Australia, alive in a rock pool, and dead in numbers. Some

specimens are quite white, but others are of a deep bluish-purple in the aperture and on the columella, and the colour is faintly visible through the shell. The largest example is 26 mm. long, and 16 mm. in its greatest diameter.

This species was kindly identified by Mr. Gatliff, from Victorian specimens, compared with the British Museum type by Mr. Gabriel, with Mr. E. A. Smith's help.

Coralliophila rubrococcinea, Melvill and Standen.

Coralliophila rubrococcinea, Melvill and Standen, Proc. Zool. Soc., Lond., 1901, p. 401, pl. 21, f. 2. *Type locality*.—"Persian Gulf." Gatliff and Gabriel, Proc. Roy. Soc., Vict., 1908, vol. xxi. (N.S.), part 1, p. 368, "Port Fairy and San Remo. Victoria."

Port MacDonnell Beach.

Identified by Mr. Gatliff, as in the previous species.

Trophon columnarius, Hedley and May.

Trophon columnarius, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 121, pl. xxiv., f. 22. *Type locality*.—100 fathoms off Cape Pillar, Tasmania.

Dredged in 40 fathoms off Beachport, three good (one identified by C. Hedley, from type in Austr. Mus.).

Trophon molorthus, Hedley and May.

Trophon molorthus, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 122, pl. xxiv., f. 23. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Dredged in 150 fathoms off Beachport, five; in 200 fathoms, five; also, in 130 fathoms off Cape Jaffa, three: all dead shells; identified by C. Hedley, from type in Austr. Mus., Sydney.

Marginella columnaria, Hedley and May.

Marginella columnaria, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 120, pl. xxiii., f. 19. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Dredged in Gulf St. Vincent at depths below 25 fathoms, one alive, six good, ten poor; in Backstairs Passage, 22 fathoms, five alive, and in 12, 15, 17, and 20 fathoms, eight dead; in 40 fathoms off Beachport, three good, three poor; in 45 fathoms east of Neptune Islands, one good, immature; in 55 fathoms north-west of Cape Borda, two good and four immature; and in 90 fathoms off Cape Jaffa, one very poor. This species seems, therefore, to live chiefly at about 20 fathoms, and beyond 60 fathoms to be found only in poor condition.

Limæa parvula, sp. nov. Pl. xv., f. 10 to 13.

Shell small, thin, white; obliquely oval. Umbos central, inflated, projecting approximate. Hinge-margin straight;

dorsal area transversely elongate, narrowly triangular. Anterior dorso-lateral angle obtuse, about 135 deg.; posterior about 100 deg. Anterior border slightly concave for about one-fourth of its length, then uniformly slightly convex. Posterior border much shorter, at first sub-concave, then nearly straight. Ventral border semicircular, joining the anterior border with a more open sweep than the posterior. Surface convex; with sixteen radial ribs, smooth, rounded, nearly as wide as the interspaces, with several intercalated riblets. Concentric striæ granulate the intercostal spaces, and form sublenticular costulæ on the sides, more marked on the anterior, near the dorsal border.

The cartilage-pit is sub-central, and triangular crossing the dorsal area to the umbo, concave. Hinge-plate narrow near the pit, widest at the angles; teeth about seven on each side, diverging, extending slightly along the lateral borders.

Interior slightly furrowed by the ribs. Ventral border squarely denticulated.

Dim.—Umbo-ventral diameter, 3·5 mm.; 3·7 mm., including the umbo; antero-posterior, 3 mm.

Hab.—Type locality, 104 fathoms, 35 miles south-west of Neptune Islands, 40 valves; 90 fathoms off Cape Jaffa, 1 valve.

Type in Dr. Verco's collection.

Mytilicardia crassicosta, Lamarck.

Cardita crassicosta, Lamarck, Anim. S. Vert., 1819, vol. vi., pt. 1, p. 24, No. 13.

Cardita citrina, Lamarck, *op. cit.*, p. 637, No. 21.

Cardita crassicostata, Reeve; Conch. Icon., 1843, vol. i., pl. 2, f. 7, a, b, c, d, e.

Cardita tridacnoides, Menke; Moll. Nov. Holl., 1843, p. 39, No. 222.

Dredged alive at all depths from 8 fathoms to 24, in both Gulfs and Straits. Very young individuals have been taken alive in 45 fathoms off Beachport and east of the Neptunes, and in 55 fathoms off Cape Borda. Small valves occur in numbers in 100 and 110 fathoms off Beachport, and in 130 fathoms off Cape Jaffa. It would appear as if very few mature shells are found above 15 fathoms, though the range of the smaller individuals extends to over 50 fathoms.

Some small specimens are of a uniform rosy-pink colour; others have the dorsal two-thirds of the posterior half of a very dark-brown internally. The ventral border may be quite straight, or very deeply excavate in front of its centre. There may be a sort of dorsal fin just in front of the posterior-dorsal angle, due to expansion of a radial rib. The shell may be elongate transversely and low umbo-ventrally, or short

and very high. The ribs may be acute and scaly, or may become nearly obsolete, especially behind the umbo-ventral ridge.

It may attain a transverse length of 65 mm., 10 mm. more than that of Lamarck's type. This may vary considerably in proportion to the umbo-ventral height, as may also the prominence of the curved costal scales.

Mytilicardia calyculata, Linnæus.

Chama calyculata, Linnæus; Syst. Nat., 1767, p. 1138.

Cardita calyculata, Lamarck; Anim. S. Vert., 1819, vol. vi., part 1, p. 24.

Cardita aviculina, Lamarck; *op. cit.*, p. 26, No. 20.

Cardita excavata, Deshayes; Proc. Zool. Soc., Lond., 1852, p. 100, pl. xvii., f. 1-3.

Mytilicardia tasmanica, Tenison-Woods; Proc. Roy. Soc., Tasm., 1876, p. 161.

Taken on the beach at Venus Bay, West Coast of South Australia; very rarely dredged.

Mytilicardia concamerata, Chemnitz.

Cardita concamerata, Reeve, Mon., t. 9, f. 42.

Thecalia macrotheca, A. Adams and Angas, Proc. Zool. Soc., Lond., 1864, p. 39.

Mytilicardia concamerata, Chemnitz, Tate, Trans. Roy. Soc., S. Austr., vol. ix., 1886, p. 100.

The habitat is given as "under stones at low tide," "Rapid Bay, South Australia" (Coll. Angas). But there were no specimens in Tate's collection. I have not taken it anywhere, nor has any collector other than Angas recognized it. It does not appear to have been recorded from Victoria, Tasmania, or Western Australia. Possibly some shells from elsewhere were by mistake placed among those in Angas's collection from South Australia.

Venericardia dilecta, E. A. Smith.

Pl. xiv., f. 8.

Cardita dilecta, E. A. Smith; Challenger Rep., Zool., 1885, vol. xiii., p. 213, pl. xv., f. 4, 4a. *Dim.*—Length 8 mm., height 6 mm., diameter 5.5. *Hab.*—"Off East Monceur Island, Bass Strait," in 38 to 40 fathoms.

This has been dredged in Backstairs Passage in 17 fathoms, two alive and many valves; in 22 fathoms, two alive and forty-eight valves; and in Gulf St. Vincent, depth unnoted, many alive and dead; in 25 fathoms off Beachport, two poor valves; in 45 fathoms east of the Neptune Islands, one alive and eighteen valves; in 55 fathoms off Cape Borda, two poor valves; in 100 fathoms off Beachport, eight valves in poor and nine in moderate condition; in 130 fathoms off Cape

Jaffa, one whole shell and one valve, both in poor condition. This species would seem to live in water up to 45 fathoms, but not beyond. Its limit in shallow water below 17 fathoms is unknown.

My examples are 8·2 mm. by 6·7, and 8·1 by 6·9 mm., and are, therefore, proportionately somewhat higher than the type, but otherwise correspond. One is 9·25 mm. by 7·5, a large specimen.

Venericardia dilecta, E. A. Smith. Var. *excelsior*, var. nov.
Pl. xiv., f. 9.

It closely resembles *C. dilecta*, Smith; but is rather more ventricose, is less equilateral, the umbo being more anterior, the post-dorsal border is longer and less sloping, the umbo-ventral depth is greater, the ribs are not quite so valid, the ventral margin is more curved, it has not the pink tinge about it, it is blotched and articulated with a darker brown.

Dim.—Length; 7·8 mm.; height, 7·3 mm.

Hab.—55 fathoms off Cape Borda, one valve; 100 fathoms off Beachport, six alive, and more than 750 valves quite fresh; 130 fathoms off Cape Jaffa, four alive, thirty-three valves quite fresh; 150 fathoms off Beachport, one alive, 750 valves; 200 fathoms off Beachport, forty-nine valves, and one alive. The proper habitat of this shell is evidently from 100 to 150 fathoms, only one valve having been found at a less depth. This circumstance, with the hiatus of about 50 fathoms between it and *V. dilecta*, almost suggests its right to be considered a separate species.

It is much more orbicular than my specimens of *V. dilecta*, and still more so than the type. Curiously enough Mr. Smith's artist has drawn a figure which, instead of corresponding with the dimensions in his text, measures exactly 26·5 mm. both in height and length, so as to represent an orbicular shell, instead of 26·5 in length and 19·9 in height, which are the proportions of his described type.

Some of my specimens are quite white, and some have concentric bands of a less opaque white in them.

Type in Dr. Verco's collection.

Venericardia amabilis, Deshayes.

Cardita amabilis, Deshayes; Proc. Zool. Soc., Lond., 1852, p. 102, pl. xvii., f. 8, 9, *Hab.*—"New Zealand"; Tate and May, Proc. Linn. Soc., New South Wales, 1901, part 3, p. 434, "South coast of Tasmania"; Pritchard and Gatliff, Proc. Roy. Soc., Vict., 1904, vol. xviii. (N.S.), part 1, p. 232, "Western Port, Victoria."

Dredged alive in Spencer Gulf in 17 fathoms and 20 fathoms, about two-thirds full-grown size; in 25 fathoms off Beachport, one small individual alive, also two valves full

grown; in 40 fathoms off Beachport, one alive, immature, and 152 valves, the largest being 22 mm. antero-posteriorly and 19.5 mm. umbo-ventrally; in 45 fathoms east of Neptunes, four valves; in 49 fathoms off Beachport, nine valves, half grown; in 62 fathoms north-west of Cape Borda, two valves; in 90 fathoms off Cape Jaffa, five alive up to 10 mm. in length, and 104 valves up to 12 mm.; in 100 fathoms off Beachport, one alive, immature, and 140 valves up to 13 mm. in length; in 130 fathoms off Cape Jaffa, very many valves; in 150 fathoms off Beachport, 107 valves; in 200 fathoms off Beachport, fifty-two valves up to 10 mm. in length. Its range in depth is considerable, up to 100 fathoms in life, and up to 200 fathoms as valves in quantity.

The smaller individuals appear to be comparatively longer; thus the measurements are 9.75 antero-posteriorly, 8.25 umbo-ventrally, 5.50 sectionally; then 12.5, 11.25, 8.25, and 17.5, 17.5.

This shell has been previously recorded for South Australia by Prof. Tate in Trans. Roy. Soc. S. Austr., 1888, vol. xi., p. 68, as *C. beddomei*, E. A. Smith, Chall. Rep. Zool., 1885, vol. xiii., p. 211, pl. xv., f. 5. But our shell is identical with shells from Tasmania and Victoria sent as *C. amabilis*, Desh., and I cannot recognize any specific distinction between our species and the description and figure of Deshayes, or between those of Deshayes and Smith. I think *V. beddomei* will prove to be a synonym of *V. amabilis*.

Cardita gemmulifera, Tate, Trans. Roy. Soc. S. Austr., 1892, vol. xv., p. 130, pl. i., fig. 9, is only a mild variant of the above, and cannot be granted specific position.

Venericardia quoyi, Deshayes.

Cardita quoyi, Deshayes; Proc. Zool. Soc., Lond., 1852, p. 103, no plate: *Hab.*—"New Holland"; Tate and May, Proc. Linn. Soc., New South Wales, 1901, part 3, p. 434, "Badger Island," Tasmania; Pritchard and Gatliff, Proc. Roy. Soc., Vict., 1904, vol. xviii. (N.S.), part 1, p. 232, "Flinders, Western Port," Victoria.

Cardita rosulenta, Tate; Trans. Roy. Soc., S. Austr., 1887, vol. ix., p. 69, pl. v., f. 3, "Encounter Bay and Backstairs Passage."

Dredged alive in Eastern Cove, Kangaroo Island, one specimen in 11, in 14, and in 19 fathoms; also in Backstairs Passage, two in 13 fathoms, two in 16 to 18 fathoms, three in 20 fathoms, and one in 22 fathoms. Valves only were taken in good condition in 25 fathoms off Beachport, two, and in 40 fathoms, twenty-four valves; in 55 and 60 fathoms off Cape Borda, eighteen; in 110 fathoms off Beachport, six; in fair condition in 130 fathoms off Cape Jaffa, six; in 150 fathoms off Beachport, one; and in 200 fathoms, two.

Venericardia squamigera, Deshayes.

Cardita squamigera, Deshayes; Mag. Zool., 1853, p. 10; Reeve, Conch. Icon., pl. iv., f. 14: *Hab.*—"Unknown"; Tate, Trans. Roy. Soc., S. Austr., 1888, vol. xi., p. 68, "Spencer Gulf, off Kangaroo Island."

Dredged alive in Gulf St. Vincent, Spencer Gulf, and in Backstairs Passage; four in 10 fathoms, five in 12, one in 15, two in 17, seven in 20, five in 22 fathoms. Valves were taken, but only of small size, as follows:—Seventeen in 55 fathoms and one in 62 fathoms off Cape Borda; one in 110 fathoms off Beachport; and two in 300 fathoms off Cape Jaffa. I have not collected it on any of our beaches.

It attains a length of 25 mm., with a height of 19 mm., nearly three times the dimensions given by Tate, *viz.*, three-eighths of an inch by a quarter of an inch, or 9 mm. by 6.

Venericardia bimaculata, Deshayes.

Cardita bimaculata, Deshayes; Proc. Zool. Soc., Lond., 1852, p. 101, pl. xvii., f. 4, 5: *Hab.*—"New Zealand, Coll. Cuming;" Tate, Trans. Roy. Soc., S. Austr., 1892, vol. xv., p. 134, records it for South Australia, and says "it is not admitted by Prof. Hutton in his revised list of New Zealand Mollusca" as living in New Zealand; Tate and May, Proc. Linn. Soc., New South Wales, 1901, vol. xxvi., part 3, p. 434, for Tasmania: Pritchard and Gatliff, Proc. Roy. Soc., Vict., 1904, vol. xviii. (N.S.), part 1, p. 232, "Port Phillip and Western Port."

Cardita gunni, Deshayes; Proc. Zool. Soc., Lond., 1852, p. 101, *Hab.*—"Van Diemen's Land" (Coll. Cuming).

Cardita atkinsoni, Tenison-Woods; Proc. Roy. Soc., Tasm., 1876, p. 27, *Hab.*—"Long Bay, Tasmania."

This species varies greatly in shape; one may be 15·25 mm. antero-posteriorly, 12 mm. umbo-ventrally, and 7·75 in section, and another 13·75, 12·25, and 9·75 in its respective measurements. The difference is not due to age, for each form can be traced from minute to full size. But intermediate grades occur. The ribs may vary from 15 to 23.

Dredged alive in Gulf St. Vincent, Spencer Gulf, Investigator Strait, and Backstairs Passage. Seven in 5 fathoms, sixty-two in 5 to 10 fathoms, twenty-seven in 10 to 15 fathoms, 134 in 15 to 20 fathoms, and sixty-four in 22 to 23 fathoms, one in 45 fathoms, off the Neptunes. Fifteen to 20 fathoms seems to be, therefore, its proper station, though one was taken alive in 40 fathoms off Beachport. Valves only were taken, sixty-five in 40 fathoms, eighteen in 55 fathoms, twelve in 60 fathoms, thirty in 100 fathoms, thirty-one in 130 fathoms, three in 150 fathoms, ten in 200 fathoms, and five in 300 fathoms.

Venericardia lutea, Hutton.

Cardita lutea, Hutton; Man. New Zealand Moll., 1880, p. 159; *Venericardia lutea*, Hutton, Hedley, Trans. New Zealand Inst., vol. xxxviii., 1905, p. 72, pl. i, f. 6.

Dredged 14 fathoms off Ardrossan, sixteen alive and several valves; 15 fathoms off Wallaroo, four alive and seven valves; 20 fathoms Gulf St. Vincent, two alive.

Venericardia columnaria, Hedley and May.

Venericardia columnaria, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 125, pl. xxv., f. 37-40. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

The South Australian shells are not quite so produced anteriorly as the type, and may have twenty-six ribs. They may reach 8·8 mm. in length and 7·7 mm. in height. Younger shells are comparatively more transverse. The colour is white, tinged with brown on the margins beyond the hinge plate; there may be brownish smears at both ends internally, or the pallial line and the muscle scars may be painted brown; or the outer surface may be faintly brown, most marked at the umbos.

Dredged in 40 fathoms off Beachport, five valves; in 49 fathoms, twelve valves; in 100 and 110 fathoms, very many valves; in 150 fathoms, seventy-six valves; and in 200 fathoms, seventeen valves; in 130 fathoms off Cape Jaffa, very many valves and one perfect shell. Its habitat is apparently from 100 to 150 fathoms.

Venericardia delicata, n. sp. Pl. xvi., f. 18, 19.

Shell rather thin, transversely oval, subequilateral. Umbos in front of centre, directed forward, rather prominent, approximate. Post-dorsal border sloping, barely concave, anterior concave. Front margin well curved, ventral less, posterior wider, somewhat truncately convex. Radial ribs twenty-four, narrower than their interspaces, high, closely and finely transversely scaled, denticulating the margins. Very fine accremental striæ crowd the intercostal spaces, a larger one corresponding with each scale. Lunule narrowly cordiform, smooth, prominent in the centre. Left valve with two diverging cardinal teeth, tiny anterior lateral tooth in front of lunule; right valve with wide triangular cardinal, socket in front of lunule, minute posterior lateral. Interior white glistening, rayed by ribs, margins denticulated.

Dim.—Antero-posterior diameter, 8·5 mm.; umbo-ventral, 7·2 mm.

Colour—Sparsely irregularly dotted outside with brown.

A living example is of a light greyish tint, spotted with brown disposed somewhat concentrically, and has the lunule

chestnut brown; and is 6.3 mm. long, 5 mm. high, and 3.8 mm. in section.

Hab.—Type, 130 fathoms off Cape Jaffa, with several valves; 90 fathoms, two alive and eighty-four valves; 300 fathoms, many valves; 110 fathoms off Beachport, six valves; 150 fathoms, twenty-four valves; 200 fathoms, twenty-three valves; 104 fathoms, thirty-five miles south-west of Neptune Islands, one alive, and many fresh valves.

Diagnosis.—It is most like *Venericardia bimaculata*, Deshayes; but is a more delicate shell, has more and narrower ribs, which are much more closely and finely scaled. The same features distinguish it from *V. quoyi*, Desh., and *V. difficilis*, Desh.

Type in Dr. Verco's collection.

Carditella exulata, E. A. Smith.

Carditella exulata, E. A. Smith; Challenger Rep., Zool., 1885, vol. xiii., p. 215, pl. xv., f. 6, 6a. *Type locality.*—"Off Nightingale Island, Tristan d'Acunha, 100 to 150 fathoms." *Dim.*—Length 4 mm., height 2.75, width 2 mm.

Our shells were taken in 130 fathoms off Cape Jaffa, four valves; 110 fathoms off Beachport, six valves; the beach at MacDonnell Bay in shell sand, many valves and one living individual; and at Kingston, Lacepede Bay, shell sand, many valves. I cannot detect any specific difference between these examples and Mr. Smith's, from his description and figure, except that ours are smaller, measuring 2.8 mm. by 1.8 mm. Some valves have the posterior part internally and the region of the lateral teeth stained brown. Tristan d'Acunha lies in about 12 deg. west longitude, and $37\frac{1}{2}$ deg. south latitude, in the middle of the Atlantic Ocean. Beachport is in about $139\frac{1}{2}$ deg. east longitude, and $37\frac{1}{2}$ deg. south latitude. The latitude in which the type shells and ours were taken is, therefore, exactly the same; as is also the depth, 100 to 150 in the one case, and 110 in the other. These two circumstances might to some extent explain their identity. It will be noted, however, that most of our specimens were taken on the beach, where also the only living individual was secured. If the identification is correct, the distance between the two stations of 162 parallels of longitude, which at that latitude may be computed as about 9,000 miles, is very interesting.

Carditella subtrigona, Tate.

Carditella subtrigona, Tate, Trans. Roy. Soc., S. Austr., vol. ix., p. 70, pl. iv., f. 10. *Type locality.*—Streaky Bay, Great Australian Bight; Tate, *op. cit.*, vol. xiv., p. 268.

Dredged alive at all depths from 17 to 24 fathoms in Gulf St. Vincent, Investigator Strait, and Backstairs Passage, as far out as Newland Head.

It may reach 10 mm. in length and 10 mm. in height. When young the shell is comparatively longer antero-posteriorly than when adult, the umbos seem to project more dorsally, and the sectional diameter is less, so that the juvenile form might be mistaken for another species. To the characters given by Tate may be added that the shell may be white with dark-brown muscle scars and hinge-plate and pallial line, and in addition some have all the inner ventral part from above the pallial line to the margin a deep purple-brown. Rarely the whole shell has a light purple tint.

***Carditella elegantula*, Tate and May.**

Carditella elegantula, Tate and May, Proc. Linn. Soc., New South Wales, vol. xxvi., 1901, part 3, p. 434. *Type locality*.—Blackman's Bay, Tasmania.

Dredged alive in Backstairs Passage in 22 fathoms and in 18 fathoms; also in Investigator Strait, 22 fathoms; dead in Spencer Gulf; Port Willunga (Mr. Kimber).

***Carditella valida*, n. sp. Pl. xvi., f. 22 to 24.**

Shell solid, obliquely transversely oval, somewhat produced anteriorly. Umbos prominent, curved forward, acute, approximate, with a minute prodissoconch cap. Post-dorsal border markedly convex; anterior concave; ventral convex, more curved in front than behind, crenulate. About nineteen valid axial ribs, rounded, interspaces very narrow. Valid close-set concentric round cords cross the costæ, scarcely visible in the interspaces. The right valve has a wide triangular cardinal tooth, an anterior lateral separated by a groove from the margin, and a posterior marginal lateral. The left valve has two diverging cardinals, of which the posterior is the larger, a posterior lateral separated by a groove from the margin and an anterior marginal lateral. The internal ventral border is well denticulated. Lunule cordiform, depressed, smooth. Escutcheon long, lanceolate. Ligament visible externally. Colour brownish, especially over the posterior third. Internally brown in the posterior part fading anteriorly, lateral teeth brown, and inside the ventral margin. It may be wholly white, or of a very light purple tint.

Dim.—Antero-posterior diameter, 3·7 mm.; umbo-ventral, 3·6 mm.

Hab.—Encounter Bay (Tate); Gulf St. Vincent, under 22 fathoms, several alive and many valves. Taken in small numbers and poor condition in 25, 40, 62, 110, and 130 fathoms, from Beachport west to the Neptune Islands.

Diagnosis.—It was recorded by Tate for South Australia as *C. infans*, E. A. Smith, in Trans. Roy. Soc., S. Austr.,

vol. ix., 1886, p. 100, and listed by Adcock in his Handlist, 1893, No. 146. Mr. Hedley has sent me Smith's species, obtained from the type locality, and it appears to have less curved dorsal borders and fewer ribs, which are scaled, and not corded.

It very closely resembles *C. elegantula*, Tate and May, of which it may prove to be only a variety, in which case its name will indicate the difference, for it has fewer and higher ribs, with bolder and less crowded concentric cords, and is somewhat less oblique.

Type in Dr. Verco's collection.

Carditella vincentensis, n. sp. Pl. xvi., f. 20, 21.

Shell solid, roundly trigonal. Umbos projecting, approximate, curved forward. Dorsal borders converge at about a right angle; posterior straightly convex, anterior slightly excavate. Lunule elongate-cordate, depressed, smooth, its centre prominent, and seen as a convexity in the profile of the shell. Escutcheon well marked, elongate, bevelled edges, left valve overlapping the right. Twenty-two flattened rounded ribs, the posterior straight, the anterior concave forwards, interstices linear. Well-marked concentric liræ cross the ribs and spaces. Right valve has a central triangular cardinal tooth, a long anterior lateral tooth separated from the margin by a groove, and a thin posterior marginal lateral. The left valve has two diverging cardinal teeth, a posterior lateral separated from the margin by a groove, and an anterior marginal lateral tooth. The lateral teeth and sockets are microscopically vertically striate. Ventral border well denticulated internally. Colour white, reddish-brown tint on the posterior third of the shell, deepest at the posterior inferior angle.

Dim.—Antero-posterior diameter, 3 mm.; umbo-ventral, 2·85 mm.

Hab.—Gulf St. Vincent, Spencer Gulf, and Backstairs Passage, 20 and 22 fathoms, several alive and many valves.

Variations.—The posterior dorsal border may be quite straight. The colour may be wholly white, the brown tint may be continued across the middle to the front border, or it may be disposed in radially elongate spots on the ribs.

Diagnosis.—From *C. elegantula* by its straighter posterior border, by the prominence of the centre of its lunule, by being more equilateral, and by its colour.

Type in Dr. Verco's collection.

Cuna atkinsoni, Tenison-Woods, sp.

Kellia atkinsoni, Tenison-Woods, Proc. Roy. Soc., Tasm., 1877 (1876), p. 158. *Type locality.*—Long Bay, Tasmania.

Carditella atkinsoni, Tenison-Woods, Tate and May, Proc. Linn. Soc., New South Wales, vol. xxvi., 1901, part 3, p. 435, pl. xxvii., f. 107.

Cuna atkinsoni, Tenison-Woods, Hedley and May, Records Austr. Mus., vol. vii., No. 2, 1908, p. 113, 100 fathoms off Cape Pillar, Tasm.

Dredged Gulf St. Vincent, under 22 fathoms, many whole and valves; 110 fathoms off Beachport, one valve; 130 fathoms off Cape Jaffa, five good valves.

Some examples have very fine concentric striæ and fewer marginal denticulations; others seem very solid, probably from senility; and one variety is much narrower and more solid, and has a broad solid hinge-plate; but the examples were too few to create a new species from them.

Cuna hamata, Hedley and May.

Cuna hamata, Hedley and May. Records Austr. Mus., vol. vii., No. 2, 1908, p. 124, pl. xxv., f. 33-36. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Dredged off Beachport in 40 fathoms, one alive, eighty-six good valves; 49 fathoms, ten poor valves; 100 fathoms, fifteen good valves; 150 fathoms, sixty-five good valves; north-west of Cape Borda, 62 fathoms, ten poor valves; off Cape Jaffa, 130 fathoms, thirty-nine good valves. It has evidently a wide range in depth, though none were taken in 200 or 300 fathoms.

During life it is of a translucent horn colour, opaque white when dead.

Cuna obliquissima, Tate, sp.

Cardita obliquissima, Tate, Trans. Roy. Soc., S. Austr., vol. ix., 1887, p. 70, pl. v., f. 9. *Type locality*.—22 fathoms, Encounter Bay.

Dredged at different depths in Gulf St. Vincent and Backstairs Passage; seven miles south-west of Newland Head in 20 fathoms, one alive, of faint pink tint; off Beachport in 40 fathoms, twelve good valves; in 49 fathoms, seventeen poor valves; off Cape Borda in 55 fathoms, one whole and twenty-five good valves; in 62 fathoms, four whole and three valves, all poor; off Beachport in 110 fathoms, nine valves, in moderate condition; in 150 fathoms, two valves, moderate. This lives chiefly in water up to 25 fathoms, and is in poor state above 60 fathoms, and not found above 150.

In addition to the stout "four or five radial riblets" on the posterior slope noted by Tate, living shells show fine axial riblets over the whole surface, quite to the anterior margin. The "distant concentric grooves" do not correspond in direction with the fine microscopic accremental striæ, but cut them obliquely from the front downwards and backwards,

and each one slightly notches the ventral margin on its outer aspect, the notches of successive grooves being more anterior. In very young living shells the grooves are very deep at the anterior margin, so as to form distinctly projecting lamellæ here. The prominent prodissoconch is well preserved as a tiny concentrically hollowed cap.

Cuna delta, Tate and May, sp.

Carditella delta, Tate and May, Trans. Roy. Soc., S. Austr., vol. xxiv., 1900, p. 102.

Cuna delta, Tate and May, Verco, Trans. Roy. Soc., S. Austr., vol. xxxi., 1907, p. 109. See references there.

Dredged also in 104 fathoms, thirty-five miles south-west off Neptunes, and in 130 fathoms off Cape Jaffa, one valve at each station. Its habitat is evidently in the shallower water, not beyond 22 fathoms.

Cuna cessens, n. sp. Pl. xiv., f. 4 to 7.

Shell rather thin, trigonal, almost equilateral. Umbonal angle rather less than a right angle. Apex capped by a minute prodissoconch. Dorsal borders nearly straight, the posterior barely excavate, the anterior barely convex. Anterior and posterior ventral angles well marked. Ventral border convex, not crenulated. Exterior dull, rough, sordid, with about ten obsolete radials; and several concentric imbrications or growth-rests, besides obsolete accremental striation. Anterior and posterior sides somewhat excavate into long lunule and escutcheon, the posterior more deeply than the anterior. The right valve has a large triangular cardinal tooth, and a small posterior above and behind the ligamental pit. The left valve has a large anterior cardinal, and a depression behind the socket of the right wedge tooth for the ligament, separated by a tooth, and a small one above and behind the pit. Each valve has a marginal lateral, and a lateral separated from the margin by a groove. The internal ventral border is not denticulate. The interior is white with the ribs and imbrications visible through the shell. Colour is a dull light horn tint.

Dim.—Antero-posterior diameter, 1·8 mm.; umbo-ventral, 2·1 mm.; sectional, '9 mm.

Dredged in Backstairs Passage, 22 fathoms, several alive and valves.

Diagnosis.—Its closest ally is *C. delta*, Tate and May; but it is less solid, has a wider umbonal angle, has a smaller sectional diameter, has the concentric rest gradations, and no marginal denticulations.

Type in Dr. Verco's collection.

Cuna concentrica, Hedley.

Cuna concentrica, Hedley, Mem. Austr. Mus., vol. iv., 1902, p. 315; Verco, Trans. Roy. Soc., S. Austr., vol. xxxi., p. 109, *q.r.*

Cuna edentata, n. sp. Pl. xiv., f. 1 to 3.

Shell ovate-trigonal, white, glossy, solid. Anterior and posterior lateral borders nearly straight, the latter rather shorter. Ventral border convex, slightly produced anteriorly. A small prominent prodissoconch cap, about three-fourths of a circle. Exterior has crowded concentric valid ribs, but no radial sculpture. The right valve has a large central triangular tooth, a minute anterior, at the extremity of the long antero-lateral tooth, which is separated by a groove from the margin, a marginal postero-lateral, with a minute cardinal tooth above it, and above that a marginal socket for the left posterior cardinal. The left valve has a large anterior cardinal tooth, and a small posterior behind the cartilage-pit, a long low postero-lateral tooth separated by a groove from the margin, and a marginal antero-lateral.

The inner ventral border is not dentated, whence the name.

Dim.—Antero-posterior diameter, 1.6 mm.; umbo-ventral, 1.9 mm.

Hab.—Gulf St. Vincent, dredged several.

Diagnosis.—It is very like *C. concentrica*, Hedley, but the smooth internal ventral border distinguishes it.

Type in Dr. Verco's collection.

Cuna comma, n. sp. Pl. xvii., f. 29 to 31.

Shell solid, white, glossy, obliquely pyriform, with a distinct three-quarter circle prodissoconch. Antero-lateral border convex; postero-lateral concave below the umbo, then straight, much shorter; ventral border convex produced anteriorly. Outer surface closely concentrically ribbed, no radial sculpture. The right valve has a large central curved cuneate tooth in front of the cartilage-pit, and a small posterior tooth just below the umbo, with a little socket outside and below it. The left valve has a large curved anterior tooth, a lamina in front of the cartilage-pit, a small posterior tooth behind the pit, and a small socket above and in front of it. The antero-lateral in the right valve and the postero-lateral in the left are separated from the margin by a groove to receive the corresponding marginal lamina of the other valve. The internal ventral border is not denticulated.

Dim.—Antero-posterior diameter, 2.6 mm.; umbo-ventral, 3.2 mm.

Hab.—Dredged alive in 22 fathoms in Backstairs Passage, and in 20 fathoms off Newland Head; also in Gulf St.

Vincent, very many; in 40, 45, 49, 55, 62, 110, and 130 fathoms, from Beachport to the Neptune Islands, but mostly in poor condition.

Diagnosis.—From *C. concentrica*, Hedley, by its curved lateral and non-denticulated ventral borders; from *C. edentata*, by its larger size and curved lateral borders; from *C. atkinsoni*, by the character of the hinge and the non-denticulated border.

Type in Dr. Verco's collection.

Condylocardia subradiata, Tate, sp. Pl. xvii., f. 25 to 28.

Carditella subradiata, Tate, Trans. Roy. Soc., S. Austr., vol. xi., 1888, pl. xi., f. 7. *Type locality*.—Shell sand, Royston Head.

Dredged off Royston Head, 20 fathoms, one alive, large; Backstairs Passage, 22 fathoms, one alive and six valves; off Beachport in 40 fathoms, fourteen valves; in 49 fathoms, very many valves, good; in 110 fathoms, nine whole and very many valves; in 90 fathoms off Cape Jaffa, many valves; east of North Neptune Island in 45 fathoms, one whole, three valves, all poor; north-west of Cape Borda in 62 fathoms, five alive and many valves, good; thirty-five miles south-west of Neptune Islands in 104 fathoms, four valves, poor. It seems to live in water from 20 to 100 fathoms.

Its generic location has been changed. Tate did not allude to its dentition in his description, and only the external surface was figured. His type, which is the only example in his collection, was fixed on a card to show the outer surface, and was regarded by him as a left *Carditella* valve, produced posteriorly; but it proves to be a right *Condylocardia* valve, produced anteriorly. It has a distinct prodissoconch scale, separated by a narrow groove from the hinge-plate below. A large subcentral cartilage pit is bounded in front by a comparatively long diverging cardinal tooth, and behind by a thinner, lower, and shorter diverging lamina. The long antero-lateral tooth is separated from the margin by a groove, and the postero-lateral tooth is marginal.

Two other valves have furnished the illustrations of the hinge of this species, which may be more fully described thus: accepting Bernard's conclusion for his genus that the anterior is the produced side. The right valve has a diverging front cardinal tooth, and a long antero-lateral separated from the margin by a groove; this receives the antero-lateral marginal lamina of the left valve; this lamina is continued as a sort of hook round the dorsum of the right cardinal, and as a diverging left cardinal down its posterior side, where it rests on a low narrow shelf at the base of, and forms the socket of, the right cardinal and also the anterior wall of

the central cartilage pit. The left valve has a posterior diverging cardinal tooth, and a long postero-lateral tooth separated from the margin by a groove, which receives the postero-lateral marginal lamina of the right valve. The socket of this cardinal is completed by a diverging tooth in the right valve, lying anterior to it, where it rests on a low ledge, and so forms also the posterior wall of the cartilage pit; this is completed dorsally by a horizontal projection forwards from the right posterior cardinal just beneath the edge of the prodissoconch, where there is a horizontal groove in each valve.

Condylocardia compressa, Hedley and May, sp.

Cuna compressa, Hedley and May. Records of the Australian Museum, vol. vii., No. 2, 1908, p. 124, pl. xxiv., f. 29, 30, 31, 32. *Type locality*.—100 fathoms, off Cape Pillar, Tasmania.

Dredged off Beachport in 40 fathoms, three alive and ninety valves; in 49 fathoms, one whole and fifty valves; in 110 fathoms, one whole, twenty-seven valves, several of them poor; in 150 fathoms, twenty-five valves, rather poor; in 200 fathoms, two valves, poor; north-west of Cape Borda in 62 fathoms, twenty-three valves; and off Cape Jaffa in 130 fathoms, one valve. In 40 fathoms would appear to be its real habitat.

It comes very close to *C. subradiata*, Tate, but its greater number of less valid ribs and its more transverse shape when young distinguish it.

I suggested to Mr. Hedley that this species is a *Condylocardia* and not a *Cuna*; and he has re-examined the dentition and concurs in its generic transference. It is comparatively a gigantic species for the genus, which contains (with the exception of *C. subradiata*, Tate) only minute shells.

Condylocardia ovata, Hedley.

Condylocardia ovata, Hedley, Proc. Linn. Soc., New South Wales, 1905, part 4, vol. xxx., p. 539, pl. xxxi., f. 5, 6; Verco, Trans. Roy. Soc., S. Austr., 1907, vol. xxxi., p. 109.

Condylocardia trifoliata, Hedley.

Condylocardia trifoliata, Hedley, Proc. Linn. Soc., 1906, vol. xxxi., p. 475; Verco, Trans. Roy. Soc., S. Austr., 1907, vol. xxxi., p. 109.

Condylocardia pectinata, Tate and May.

Carditella pectinata, Tate and May, Trans. Roy. Soc., S. Austr., 1900, vol. xxiv., p. 103. *Type locality*.—"Derwent Estuary, Tasmania" (W. L. May); Proc. Linn. Soc., New South Wales, 1901, vol. xxvi., part 3, p. 435, pl. xxvii., f. 96, 97.

Condylocardia pectinata, Tate and May, sp., Hedley, Mem. Austr. Mus., 1902, vol. iv., part 5, p. 318, "63-75 fathoms, off

Port Kembla, and in Sydney Harbour;" Pritchard and Gatliff, Proc. Roy. Soc., Vict., 1904, vol. xvii. (N.S.), part 1, p. 231, "Dredged off Rhyll, Western Port."

Dredged in 22 fathoms Backstairs Passage, several; also alive and valves in Spencer Gulf and Gulf St. Vincent at unrecorded depths. Taken on Kingston Beach whole and as valves.

Condylocardia porrecta, Hedley.

Condylocardia porrecta, Hedley, Proc. Linn. Soc., New South Wales, 1906, vol. xxxi., part 3, p. 475, pl. xxxviii., f. 24. *Type locality*.—"Mast Head Reef, Queensland."

Dredged Gulf St. Vincent below 22 fathoms, several alive. One small individual has only twelve ribs.

Condylocardia australis, Bernard.

Condylocardia australis, Munier-Chalmas (*nomen*). Bernard; Etudes Comparatives sur La Coquille des Lamellibranches Condylocardia, Paris, 1896, p. 12, pl. vi., f. 4. *Type locality*.—Ile St. Paul (M. Velain).

Dredged Gulf St. Vincent, several whole and valves.

The South Australian shell is scarcely as transverse as that figured, and is more crenulated at the margin, but Bernard describes his as "*margo ventralis crenatus*," and this character varies in our specimens, as do also the wideness and roundness of the radial ribs.

St. Paul Island, if that situated in the Atlantic is referred to, is very distant; but no further than several other accredited specimens extend.

Condylocardia crassicosta, Bernard.

Condylocardia crassicosta, Bernard; Etudes Comparatives sur La Coquille des Lamellibranches Condylocardia, Paris, 1896, p. ii., pl. vi., f. 1. *Type locality*.—Stewart Island (M. Fillhol), New Zealand, taken in 35 fathoms.

Dredged in Backstairs Passage 22 fathoms, several alive; also in Spencer Gulf and Gulf St. Vincent. Received from Mr. C. J. Gabriel, under the name of *C. pectinata*, taken at Frankston, Port Phillip, and Westport Bay. It differs from *C. pectinata* in the smaller number of ribs, seven to ten only, in their greater height, and in the shape of the shell.

EXPLANATION OF PLATES.

PLATE XIV.

1. *Cuna edentata*, Verco, exterior.
- 2, 3. " " " interior.
4. " *cessens*, Verco, exterior.
5. " " " side view.
- 6, 7. " " " hinge.
8. *Venericardia dilecta*, E. A. Smith, exterior.
9. " " " var. *excelsior*, Verco, exterior.

PLATE XV.

10. *Limæa parvula*, Verco, exterior.
 11. " " " interior.
 12, 13. " " " hinge.
 14. *Turritella kimberi*, Verco.
 15. " " " protoconch.
 16. *Arcularia grandior*, Verco.
 17. " " " a variant to show the aperture.

PLATE XVI.

18. *Venericardia delicata*, Verco, interior.
 19. " " " exterior.
 20. *Carditella vincentensis*, Verco, exterior.
 21. " " " interior.
 22. " " *valida*, Verco, exterior.
 23, 24. " " " hinge.

PLATE XVII.

25. *Condylocardia subradiata*, Tate, type shell, exterior
 26. " " " " interior.
 27, 28. " " " " not the type shell, showing the hinge.
 29. *Cuna comma*, Verco, exterior.
 30, 31. " " " hinge.

PLATE XVIII.

- 32, 33. *Turbo jourdani*, Kiener, operculum.
 34, 35. " *stamineus*, Martyn, "
 36, 37. " *gruneri*, Philippi, "
 38, 39. " *undulatus*, Martyn, "
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